UPDATE ON EDN^{TM} FOR PRE-PLANT APPLICATION

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EDN (active ingredient -Ethanedinitrile C_2N_2) is a broad-spectrum fumigant, highly toxic to soil borne pathogens, nematodes, weeds and insects. EDN is neither an ozone depleting substance nor it is a green-house gas. It is approved in Australia and in the process of approval in Israel, South Africa, Turkey and Russia. EDN has a number of advantages for pre-plant application. EDN is a "true fumigant" means it disperses through the soil pores primarily as a gas (boiling point is -21 ° C), dissolve in the soil water (450 cm^3/100 cm^3 water @ 20°C) and kill the target pests found in both air and water surrounding the soil particles. EDN and its metabolite break down quickly in the treated soil hence, replanting of vegetable and fruit crops can be done after 2 weeks of application. Based on these characteristics, EDN could be a solution for the growers shifting to alternative fumigants to maintain the crop production as a result of methyl bromide phase out.

In Australia, an efficacy trial was conducted to control soil borne pathogens (*Fusarium* and *Pythium sp)* and weeds in an ornamental field. Two EDN rates (50 and 60 g/m^2) were applied using shank injection and compared with control and standard fumigant. The treatment beds were randomly replicated. EDN dose rates completely suppressed the disease population compared with control and standard fumigation treatment.

In USA, lab and field studies were conducted between 2017-2018 to generate efficacy data for soil borne pathogens, weeds and nematodes for approval. In the lab efficacy study, soil infested with soil borne pathogen -*Pythium ultimum*, *Verticillium dahliae*, *Macrophomina Phaseolina*, and *Fusarium oxysporum;* soil borne nematodes citrus nematode (*Meloidogyne hapla*) and cyst nematode (*Globodera rostochie*); weeds such as purslane, malva, chickweed, yellow and purple nutsedge were tested with a range of EDN concentration. The testing was conducted on two types of soils (Florida soil with a pH of 5.6 and California soil with a pH of 7.6). EDN was effective in controlling the target organisms.

Strawberry field trials were conducted at the Gulf Coast Research Education Centre and in Dover, Florida. Different rates of EDN were applied using drip application at both field locations and compared with standard application and untreated control. At GCREC, EDN out-performed all other standard fumigants and adequately controlled *Macrophomina*. In Dover, all fumigants were effective in controlling charcoal rot in the centre of the bed but EDN at the high dose rate suppressed the pathogen population at the edge of the bed as well. The total weed biomass was significantly lower following fumigation with EDN compared with untreated control and other standard fumigants.

Another strawberry field trial was conducted in Dover Florida. EDN fumigant, applied with or without Pic 100, and compared to Pic-Clor 60. EDN applied with Pic 100 reduced the yellow nutsedge, *Macrophomina* CFU count and boosted the root vigour and increased the total yield compared with other treatments.

Further scientific research is being conducted in Australia, USA, Turkey, Israel and South Africa to generate efficacy data for various pathogens and weed species and for registration approvals. The results from this ongoing research will be presented.